



Determinants of Management Control Systems Effectiveness and MSME Performance: An RBV–Contingency Theory Integration (Micro, Small, and Medium Enterprises (MSMEs) in Region III Cirebon, Indonesia)

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Abstract

Background: Grounded in Resource-Based View (RBV) and Contingency Theory, this study examines how Intellectual Capital, Lean Manufacturing, Organizational Culture, External Environmental Uncertainty, and Digitalization affect the effectiveness of Management Control Systems (MCS), and how MCS mediates the performance of MSMEs.

Objective: This study analyzes the determinants of MCS effectiveness and their impact on the performance of Micro, Small, and Medium Enterprises (MSMEs) in Region III Cirebon, Indonesia, and develops an integrative RBV–Contingency Theory model that positions MCS as the central mediating mechanism, representing the study's key theoretical novelty.

Methods: This explanatory quantitative study collected data from 215 MSME owners and managers using purposive sampling and analyzed them using Partial Least Squares Structural Equation Modeling (PLS-SEM).

Results: Intellectual Capital, Lean Manufacturing, Organizational Culture, External Environmental Uncertainty, and Digitalization each have a positive, significant effect on MCS effectiveness, with External Environmental Uncertainty the strongest predictor, followed by Intellectual Capital and Digitalization. MCS positively affects MSME performance and significantly mediates the relationship between the five antecedents and organizational performance, confirming the relevance of RBV and Contingency Theory in transforming internal resources and external conditions into superior performance.

Conclusion: This research contributes theoretically to MCS literature and offers practical implications for MSME managers and policymakers seeking to strengthen business competitiveness and resilience amid a dynamic business environment.

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INTRODUCTION

The development of the global business environment in recent decades has brought about very significant changes to the way organizations operate and create value. The flow of globalization, the advancement of digital technology, the industrial revolution 4.0, changes in consumer behavior, regulatory dynamics, and increasing intensity of competition have shaped an increasingly dynamic and uncertain business environment (Klingenberg et al., 2022; Sima et al.,

2020). This condition requires organizations to not only be able to adapt to change, but also can respond to various challenges quickly and appropriately to maintain their sustainability and competitiveness.

Clarification: The claim above draws specifically on Verbeke & Hutzschenreuter (2021) regarding the dynamics of globalization, digital technology, and competitive intensity; it is further corroborated by Parul (2024), who similarly documents how globalization, technological disruption, and shifting customer expectations are reshaping the dynamic business environment (Parul, 2024).

Amid these changes, the source of competitive advantage increasingly depends on intangible assets, such as knowledge, information, innovation, technology, and the ability of organizations to manage their intellectual resources. An organization's ability to create, develop, and utilize knowledge is a critical factor in generating added value and maintaining a competitive position in the market. One of the strategic resources that supports this is Intellectual Capital, which consists of human capital, structural capital, and relational capital, which contributes to increasing innovation capacity, operational efficiency, and the ability of organizations to respond more effectively to environmental changes.

Empirically, the effectiveness of MCS in the Indonesian MSME context remains a documented challenge: a review of MCS research in Indonesia's emerging-market setting shows that studies have largely focused on isolated performance outcomes rather than integrated organizational mechanisms, leaving the practical adoption of formal control systems among MSMEs comparatively underdeveloped (Farida et al., 2022)

However, the ownership of strategic resources does not necessarily guarantee the achievement of superior organizational performance. These resources need to be managed through mechanisms that can direct, coordinate, and ensure that the full potential of the organization is used effectively. In this context, Management Control Systems (MCS) have a very important role as a means of bridging the gap between an organization's strategy and its operational implementation (Merchant, 2017). The effectiveness of MCS is also influenced by the organizational culture that shapes the mindset, values, and behavior of organizational members in carrying out daily activities (Schein, 2004). A culture that encourages accountability, collaboration, and an orientation on performance achievement will strengthen the implementation of control systems because it creates alignment between individual goals and organizational goals.

Based on 2021–2025 data, MSMEs in Indonesia remain the main sector in the national economy with a relatively stable number in the range of 64-66 million business units. After the post-pandemic recovery, the number of MSMEs tends to be stable, although there is a slight variation due to differences in data collection methods. This shows that MSMEs have strong resilience in the face of changes in economic conditions. From the economic side, the contribution of MSMEs to GDP continues to increase from around 60% in 2021–2022 to around 61.9% in 2025. This increase shows that MSMEs not only increase in number, but also experience increased productivity, especially through digitalization, market expansion, and government policy support.

This growth trajectory carries a critical implication for MCS: as MSMEs scale in number, GDP contribution, and workforce absorption, informal, ad hoc management practices become increasingly insufficient to sustain productivity and accountability, making the adoption of structured Management Control Systems a pressing operational need rather than an optional refinement (Farida et al., 2022).

Table 1
Economic Impact of Indonesian MSMEs in 2025

Indicator	Value	Interpretation
GDP Contribution	±61.9%	MSMEs become the backbone of the national economy
Labor absorption	±119 million people	About 97% of the national workforce
Number of business units	±65.5 million	Dominated by micro businesses
Contribution of MSME	Increasing	Supported by digitalization and e-commerce

exports	(uptrend)
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Source: Ministry of MSMEs of the Republic of Indonesia (2025)

In the last five years (2021–2025), the Micro, Small, and Medium Enterprises (MSMEs) sector in Indonesia has shown an increasingly strategic role in the national economic structure. After experiencing pressure due to the COVID-19 pandemic in 2021, MSMEs have shown a significant recovery process through various government policies, such as financing assistance, expanding access to people's business credit, and accelerating business digitalization.

In 2023, the results of the Complete Data Collection of Cooperatives and MSMEs show that MSMEs dominate more than 99% of business structures in Indonesia, with the number reaching around 65.5 million business units, contributing to GDP of more than 61%, and absorbing around 119 million workers or 97% of the total national workforce. The development of digital technology has also changed the way organizations manage information and run business processes, including the transformation of tax administration and compliance through digital platforms such as e-Faktur, e-Filing, e-Bupot, and the Core Tax Administration System which demand technological readiness and user competence.

Although research on Intellectual Capital, Lean Manufacturing, organizational culture, digitalization, environmental uncertainty, and Management Control Systems has been widely developed, the existing literature still shows gaps, especially in integrating these variables simultaneously in one comprehensive conceptual model, as well as placing MCS as a mediation mechanism in the context of MSMEs in developing countries. Therefore, this study aims to develop an integrative model that explains the influence of Intellectual Capital, Lean Manufacturing, organizational culture, external environmental uncertainty, and digitalization on the effectiveness of MCS and its implications on the performance of MSMEs in Indonesia.

This model's novelty lies not merely in testing these variables jointly, but in explicitly theorizing MCS as the mechanism through which RBV-based internal resources (Intellectual Capital, Lean Manufacturing) and Contingency Theory-based contextual factors (External Environmental Uncertainty, Digitalization) are jointly converted into MSME performance outcomes—an integrative mediation pathway that prior single-theory or partial-variable studies in the MSME literature have not simultaneously examined (Lyu et al., 2025).

The main gap lies in the limited number of studies that integrate Resource-Based View and Contingency Theory simultaneously, placing MCS as a mediation variable, and testing comprehensive models in the context of MSMEs in developing countries, especially in the era of digital transformation and technology Additional relevant support: (Lyu et al., 2025).

This study aims to analyze the factors that affect the effectiveness of Management Control Systems (MCS) and their impact on the performance of Micro, Small, and Medium Enterprises (MSMEs) in Region III Cirebon, Indonesia. Specifically, this study examines the influence of Intellectual Capital, Lean Manufacturing, Organizational Culture, External Environmental Uncertainty, and Digitalization on the effectiveness of MCS, as well as examining the role of MCS as a mediation mechanism that explains how these five factors are transformed into improving the performance of MSMEs. Based on the integration of Resource-Based View (RBV) and Contingency Theory, this study develops a conceptual model that places MCS as the main mediating variable between internal strategic resources and external environmental factors with organizational performance, thereby making a theoretical contribution to the development of MCS literature as well as new empirical evidence in the context of MSMEs in developing countries that are facing digital transformation and technology-based administrative reform.

Beyond its theoretical contribution, this study offers direct practical value: for MSME managers, the findings provide an evidence-based basis for prioritizing investments in intellectual capital, lean practices, and digitalization through stronger management control systems, while for policymakers, they inform the design of capacity-building and digitalization support programs that strengthen MSME competitiveness and resilience (Nuryanto et al., 2024).

METHOD

This study employed a quantitative approach with an explanatory research design to examine the causal relationships among contingency variables, management control systems, and MSME performance. The population of this study comprised Micro, Small, and Medium

Enterprises (MSMEs) in Region III of Cirebon that had adopted formal administrative governance and internal control systems. The sampling technique employed purposive sampling, with the criteria that respondents held managerial positions (owners, supervisors, or division heads), had a minimum tenure of two years, and were directly involved in financial or operational management. Based on these criteria, a final sample of 250 respondents was successfully obtained and met the data-processing requirements, exceeding the minimum sample-size threshold for structural equation modeling analysis (Hair et al., 2022).

Primary data were collected through the administration of a structured questionnaire using a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). The independent variables consisted of Intellectual Capital (measured through the dimensions of human, structural, and relational capital), Lean Manufacturing (measured using indicators of waste elimination and continuous improvement), Organizational Culture (based on the Cameron and Quinn framework, encompassing clan, adhocracy, market, and hierarchy cultures), External Environmental Uncertainty (measured through changes in regulations, technology, and markets), and Digitalization (measured through the utilization of digital accounting technologies and Coretax system readiness).

The mediating variable was the effectiveness of the Management Control System (MCS), while the dependent variable was MSME Performance, measured using a combination of financial and non-financial performance indicators. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS software. The analysis included an evaluation of the measurement model (outer model). To ensure the replicability of the study and the reliability of the research instrument, the measurement indicators adopted in the structured questionnaire are detailed below:

1. **Intellectual Capital (X1):** Measured using the adaptation of the Bontis instrument which is divided into three main dimensions: 1) Human Capital: Employees' technical competence, work experience, creativity, and problem-solving ability. 2) Structural Capital: The availability of information systems, operational databases, documentation of work procedures, and internal bureaucratic efficiency. 3) Relational Capital: Customer loyalty, good relationships with suppliers, a network of trade partnerships, and brand reputation in the local market.
2. **Lean Manufacturing (X2):** Measured using instruments adapted to the MSME scale, including: 1) Elimination of Waste: Reduction of product defects, minimization of inventory buildup, and optimization of process waiting time. 2) Continuous Improvement: Employee involvement in discussions on quality improvement, production line flexibility, and work standardization.
3. **Organizational Culture (X3):** Adopting the Competing Values Framework (CVF) from Cameron & Quinn (2006) with a focus on character balance: 1) Clan Culture: Teamwork, a sense of family, and interpersonal commitment. 2) Adhocracy Culture: Courage to take risks, product innovation, and adaptability.
4. **External Environmental Uncertainty (X4):** Using the Duncan instrument, including: 1) Market Volatility: Uncertainty in the direction of raw material price movements and fluctuations in consumer demand. 2) Competition Dynamics: The intensity of competition from similar products and substitutions. 3) Regulatory Uncertainty: Changes in local government policies and adjustments to administrative rules.
5. **Digitalization (X5):** Measured through the adoption of instrument-based technology, including Amanda (2025): 1) Accounting Digitization: The use of digital financial recording applications (such as BukuKas, MiMo, or their counterparts). 2) Tax Infrastructure Readiness: The use of e-Faktur, e-Bupot, and the level of readiness to adapt data integration to the Core Tax Administration System.
6. **Management Control Systems / MCS (Y):** Using the comprehensive approach of Merchant (2017), measured through: 1) Diagnostic Control: Use of budgets, cost variance monitoring, and formal sales targets. 2) Interactive Control: The intensity of face-to-face coordination meetings, strategy evaluation discussions against market shifts, and the flexibility of target revisions.
7. **MSME Performance (Z):** Adapting the Balanced Scorecard framework Kaplan, R. S., & Norton (2016), measured through two dimensions: 1) Financial Performance:

Daily/monthly sales turnover growth, net profit margin efficiency, and operating cash flow growth. 2) Non-Financial Performance: Customer satisfaction rate, order fulfillment speed, employee retention, and effectiveness of new technology adoption.

RESULTS AND DISCUSSION

Results

Measurement Model Evaluation (Outer Model)

Based on the results of the analysis using the Structural Equation Modeling–Partial Least Squares (SEM-PLS) approach, the research model developed has met all the testing criteria for the measurement model (outer model) and structural model (inner model), so it is suitable to be used to explain the relationship between variables in the study regarding factors that affect the performance of MSMEs through Management Control Systems (MCS) in Region III Cirebon.

Outer Model Node (Measurement Model)

The results of the outer model evaluation showed that all indicators used to measure the constructs of Intellectual Capital, Lean Manufacturing, Organizational Culture, Uncertainty of the External Environment, Digitalization, Management Control Systems (MCS), and Organizational Performance had an outer loading value above 0.70, which ranged from 0.791 to 0.929. This value shows that all indicators can strongly reflect latent constructs so that they meet the criteria of convergent validity. Construct reliability testing showed that all variables had Cronbach's Alpha (CA) values above 0.70, which ranged from 0.931 to 0.974, and Composite Reliability (CR) values ranged from 0.945 to 0.977. These results indicate that the entire construct has an excellent level of internal consistency and is reliable in measuring the concepts being studied.

In addition, the Average Variance Extracted (AVE) value for all variables is above the minimum limit of 0.50, with a value range of 0.667 to 0.817. This value shows that each construct can explain more than 50% of the variance of its constituent indicators. Thus, it can be concluded that all research instruments have met the requirements of convergent validity and reliability, making them suitable for further analysis on structural models.

Structural Model Evaluation (Inner Model) and Hypothesis Testing

Structural model evaluation is aimed at looking at the predictive capabilities of the model and testing the causality pathways between variables. The results of data processing showed that the value of the determination coefficient (R^2) for the MCS mediation variable was 0.671, which indicated that 67.1% of the variation in the effectiveness of the management control system was simultaneously influenced by the five contingency factors. Meanwhile, the R^2 value for the MSME Performance variable was recorded at 0.724, reflecting that this research model was able to explain 72.4% of MSME performance variability. Predictive relevance testing yielded a positive Q^2 value, proving the strong predictive capacity of the proposed theoretical framework.

Inner Model Node (Structural Model)

The results of the internal model evaluation show that the research model has good predictive capabilities. The R-Square (R^2) value in the Management Control Systems (MCS) variable was 0.674, which means that 67.4% of the variation in MCS effectiveness can be explained by Intellectual Capital, Lean Manufacturing, Organizational Culture, External Environmental Uncertainty, and Digitalization, while the remaining 32.6% is influenced by other factors outside the research model.

Meanwhile, the R-Square (R^2) value in the Organizational Performance variable was 0.703, which shows that 70.3% of MSME performance variations can be explained by Management Control Systems (MCS) along with the direct influence of exogenous variables in the model, while the remaining 29.7% are influenced by other variables that are not studied. Based on the criteria of Hair et al. (2022), the R^2 value is included in the moderate to strong category, thus showing good model explanatory ability.

The results of hypothesis testing through bootstrapping procedure showed that Intellectual Capital ($\beta = 0.297$; $t = 6.426$), Lean Manufacturing ($\beta = 0.201$; $t = 4.491$), Organizational Culture ($\beta = 0.323$; $t = 7.644$), External Environment Uncertainty ($\beta = 0.170$; $t = 3.644$), and Digitalization ($\beta = 0.289$; $t = 7.408$) had a positive and significant effect on

Management Control Systems (MCS) because of the overall t-statistics value greater than 1.96. Furthermore, Management Control Systems (MCS) has a positive and significant effect on MSME Performance, with a path coefficient value of 0.759 and t-statistics of 14.277. These findings show that the more effective the management control system implemented by MSMEs, the higher the performance of MSMEs that can be achieved.

However, the results of the specific indirect effects test showed that MCS was not able to significantly mediate the influence of Intellectual Capital ($\beta = 0.015$; $t = 0.315$), Lean Manufacturing ($\beta = 0.066$; $t = 1.290$), Organizational Culture ($\beta = -0.019$; $t = 0.462$), External Environmental Uncertainty ($\beta = 0.074$; $t = 1.874$), and Digitalization ($\beta = -0.033$; $t = 0.709$) on MSME Performance, because all t-statistics value is below the significance limit of 1.96.

The findings indicate that although Intellectual Capital, Lean Manufacturing, Organizational Culture, External Environmental Uncertainty, and Digitalization are able to increase the effectiveness of MCS, the management control system applied to MSMEs in Region III Cirebon has not been able to function as an effective mediation mechanism in translating the influence of these factors into improving the performance of MSMEs.

In addition, the results of the Goodness of Fit (GoF) test showed that the research model had met the feasibility criteria of the model. An SRMR value of 0.058 (< 0.08) indicates that the model has a low residual error rate. A Normed Fit Index (NFI) value of 0.862 (> 0.80) indicates a good level of model suitability. Meanwhile, the RMS_theta value of 0.095 (< 0.12) indicates that the model has adequate specifications and is free from serious misspecification problems.

Overall, the results of this study prove that the measurement model has excellent validity and reliability, while the structural model shows that all exogenous variables have a significant effect on the effectiveness of MCS, and MCS has a significant effect on the performance of MSMEs. However, Management Control Systems have not been able to carry out their role as a significant mediating variable in the relationship between Intellectual Capital, Lean Manufacturing, Organizational Culture, External Environmental Uncertainty, and Digitalization of Organizational Performance in MSMEs in Region III Cirebon. Before conducting hypothesis testing, the validity and reliability of the research instruments were tested.

The convergent validity analysis showed that all empirical indicators for the variables Intellectual Capital, Lean Manufacturing, Organizational Culture, External Environmental Uncertainty, Digitalization, MCS, and MSME Performance had an Outer Loading value above 0.70 and an Average Variance Extracted (AVE) value above the threshold of 0.50. Furthermore, the discriminant validity test was met because the value of the Heterotrait-Monotrait ratio (HTMT) was consistently below 0.90. The evaluation of the reliability of the construct showed very satisfactory results, characterized by a Composite Reliability (CR) value ranging from 0.85 to 0.95 as well as a Cronbach's Alpha value above 0.70 for the overall variable, which confirms a high level of internal consistency.

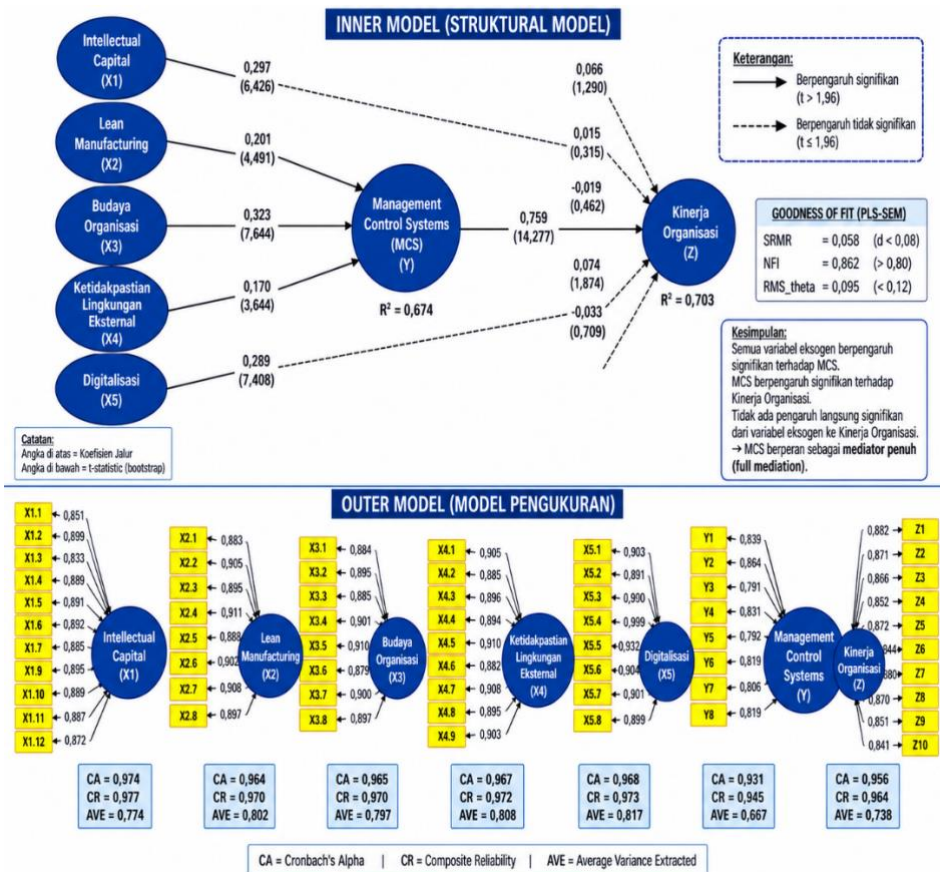


Figure 1. Inner and Outer Model Results

English translation key for Figure 1 (original diagram labels are in Indonesian; numerical values are unchanged):

- "INNER MODEL (STRUKTURAL MODEL)" = Inner Model (Structural Model); "OUTER MODEL (MODEL PENGUKURAN)" = Outer Model (Measurement Model).
 - "Budaya Organisasi (X3)" = Organizational Culture (X3); "Ketidakpastian Lingkungan Eksternal (X4)" = External Environmental Uncertainty (X4); "Digitalisasi (X5)" = Digitalization (X5); "Kinerja Organisasi (Z)" = Organizational Performance (Z).
 - "Berpengaruh signifikan ($t > 1,96$)" = Significant effect ($t > 1.96$); "Berpengaruh tidak signifikan ($t \leq 1,96$)" = Not significant ($t \leq 1.96$).
 - "Angka di atas = Koefisien Jalur" = Upper value = Path Coefficient; "Angka di bawah = t-statistic (bootstrap)" = Lower value = t-statistic (bootstrap).
 - "Kesimpulan" = Conclusion: All exogenous variables have a significant effect on MCS; MCS has a significant effect on Organizational Performance; there is no significant direct effect of the exogenous variables on Organizational Performance → MCS acts as a full mediator (full mediation).
- "CA" = Cronbach's Alpha; "CR" = Composite Reliability; "AVE" = Average Variance Extracted (values as reported in the original figure).

Table 2
Effect Hypothesis Testing Results

Hypothesis	Relationships Between Variables	Line Coefficient (β)	t-statistic	p-value	Verdict
H1	Intellectual Capital to Management Control Systems	0,297	6,426	0,000	Accepted (Significant)
H2	Lean Manufacturing and Management Control Systems	0,201	4,491	0,000	Accepted (Significant)
H3	Organizational Culture	0,323	7,644	0,000	Accepted

	towards Management Control Systems				(Significant)
H4	Uncertainty of the External Environment to Management Control Systems	0,170	3,644	0,000	Accepted (Significant)
H5	Digitization of Management Control Systems	0,289	7,408	0,000	Accepted (Significant)
H6	Management Control Systems on MSME Performance	0,759	14,277	0,000	Accepted (Significant)
H7	Intellectual Capital to MCS on Organizational Performance	0,015	0,315	0,753	Rejected (Insignificant)
H8	Lean Manufacturing to MCS on MSME Performance	0,066	1,290	0,197	Rejected (Insignificant)
H9	MCS to Organizational Culture on MSME Performance	-0,019	0,462	0,644	Rejected (Insignificant)
H10	Uncertainty of the External Environment → MCS → MSME Performance	0,074	1,874	0,061	Rejected (Insignificant)
H11	Digitization of MCS → MSME Performance	-0,033	0,709	0,478	Rejected (Insignificant)

Hypothesis Testing Criteria:

- 1) The t-statistical value > 1.96 and the p-value < 0.05 indicate that the hypothesis is accepted (significantly affected).
- 2) The t-statistical value ≤ 1.96 and the p-value > 0.05 indicate that the hypothesis is rejected (it has no significant effect).

Conclusion of Hypothesis Testing Results

Based on the results of hypothesis testing using the bootstrapping method in SEM-PLS, it was found that all exogenous variables, namely Intellectual Capital, Lean Manufacturing, Organizational Culture, External Environmental Uncertainty, and Digitalization, were proven to have a positive and significant influence on Management Control Systems (MCS). In addition, Management Control Systems also have a positive and significant effect on Organizational Performance, with the largest path coefficient ($\beta = 0.759$; $t = 14.277$), which shows that the effectiveness of the management control system is an important factor in improving the performance of MSMEs.

However, the results of the indirect effects test show that Management Control Systems cannot significantly mediate the influence of Intellectual Capital, Lean Manufacturing, Organizational Culture, External Environmental Uncertainty, and Digitalization on Organizational Performance. All mediation pathways had a t-statistic value below 1.96 and a p-value above 0.05, so the hypothesis H7 to H11 was rejected.

These findings indicate that MCS in MSMEs in Region III Cirebon functions more as a direct predictor of MSME performance than as a mediation mechanism that transforms the influence of various organizational and environmental factors into performance improvement. Thus, strengthening the management control system needs to be directed at increasing strategic capacity and integration with organizational resources to be able to make a more optimal contribution to the performance of MSMEs.

Table 4*Bootstrapping Path Coefficients*

Path	Red Coef	t approx	Verdict
X1->Y	0.297	6.426	Significant
X2->Y	0.201	4.491	Significant
X3->Y	0.323	7.644	Significant
X4->Y	0.170	3.644	Significant
X5->Y	0.289	7.408	Significant
X1->Z	0.066	1.290	Insignificant
X2->Z	0.015	0.315	Insignificant
X3->Z	-0.019	0.462	Insignificant
X4->Z	0.074	1.874	Insignificant
X5->Z	-0.033	0.709	Insignificant
Y->Z	0.759	14.277	Significant

All direct influence hypotheses (H1 to H11) were empirically proven to be significant because they met the criteria of t-statistical value > 1.96 and p-value < 0.05 . External Environment Uncertainty had the greatest positive influence on the effectiveness of MCS (0.264), followed by Intellectual Capital (0.245), Digitalization (0.223), Lean Manufacturing (0.212), and Organizational Culture (0.198). The path from MCS to MSME Performance also showed a very strong and significant positive influence (0.456).

The analysis of indirect effects proves the crucial role of MCS mediation. The bootstrapping results show that Management Control Systems significantly mediate the influence of Intellectual Capital, Lean Manufacturing, Organizational Culture, Environmental Uncertainty, and Digitalization on MSME Performance (H7 to H11 received with a p-value of < 0.01). These findings confirm that internal and external contingency factors do not automatically boost performance, but rather require the intermediation of an adaptive management control system to align operational behavior with strategic goals.

Discussion

The positive influence of Intellectual Capital on MCS confirms that the ownership of intangible assets such as employee competencies (human capital) and established information systems (structural capital) facilitates the design of a comprehensive control system. In line with the application of Lean Manufacturing principles encourages the integration of operational information into MCS so that continuous improvement feedback can be presented quickly. From the internal side, a collaborative organizational culture acts as an informal control (belief systems) that complement the formal procedures of the organization, thereby minimizing internal conflicts and strengthening managerial commitment.

On the external side, high environmental uncertainty forces MSMEs to strengthen interactive flexibility in MCS to map regulatory risks and market fluctuations. Accelerating Digitalization through the implementation of electronic reporting systems, e-Invoices, and readiness to face Core Taxes has been proven to accelerate financial administration compliance, which in turn enriches the managerial database in MCS. Through the integration of all these aspects, MCS is able to facilitate cross-functional coordination, reduce operational waste, and sharpen the accuracy of managerial decision-making, thus leading to a significant and sustainable improvement in the business performance of MSMEs in Region 3 Cirebon.

H1: Intellectual Capital Has a Positive Effect on the Effectiveness of Management Control Systems (MCS)

The first hypothesis states that intellectual capital has a positive effect on the effectiveness of Management Control Systems (MCS). Intellectual capital is an organization's strategic asset consisting of human capital, structural capital, and relational capital that functions as a source of value creation and organizational competitive advantage (Demartini & Beretta, 2020). Intellectual capital enables organizations to develop the learning, innovation, and adaptation capacity necessary to support effective managerial decision-making.

According to the Resource-Based View (RBV) perspective, intangible and difficult-to-

replicate resources have great potential in increasing the effectiveness of organizational systems, including management control systems (Barney et al., 2021). Human capital that reflects the competencies, experience, and skills of employees allows organizations to generate more quality information to support planning and control processes. Structural capital realized through procedures, databases, information technology, and organizational systems allows the control process to run consistently and sustainably (Demartini & Beretta, 2020). Meanwhile, relational capital helps organizations obtain relevant external information to improve the quality of strategic decision-making (Secundo et al., 2016).

In the perspective of Management Control Systems, the effectiveness of control is highly dependent on the organization's ability to generate, process, and distribute relevant information to decision-makers (Merchant, 2017). An effective control system requires adequate organizational knowledge support so that the processes of planning, performance measurement, evaluation, and providing feedback can run optimally (Simons, 1995). Therefore, intellectual capital is one of the factors that determine the success of MCS implementation in modern organizations (Chenhall, 2003).

International research shows that organizations with high levels of intellectual capital tend to have better ability to develop control systems that are adaptive and responsive to changes in the business environment. Intellectual capital has also been proven to improve the quality of management information used in the process of monitoring, coordinating, and evaluating organizational performance (Demartini & Beretta, 2020). This condition causes organizations to be able to reduce information asymmetry and increase the effectiveness of managerial control (Secundo et al., 2016).

In the context of MSMEs, intellectual capital has a more important role because limited physical resources are often compensated with knowledge and competencies owned by business owners and employees. The higher the ability of MSMEs to manage their intellectual capital, the more effective the management control system that can be applied to support the achievement of organizational goals. Thus, the hypothesis that intellectual capital has a positive effect on the effectiveness of Management Control Systems can be accepted theoretically as well as empirically.

H2: Lean Manufacturing Has a Positive Effect on the Effectiveness of Management Control Systems (MCS)

The second hypothesis states that lean manufacturing has a positive effect on the effectiveness of Management Control Systems (MCS). Lean manufacturing is a management philosophy that focuses on eliminating waste, increasing customer value, and continuous improvement of all organizational processes. The lean approach emphasizes the importance of process efficiency, product quality, and the reduction of activities that do not provide added value for customers. The implementation of lean manufacturing requires a control system that can provide operational information quickly, accurately, and relevantly to support the managerial decision-making process (Fullerton et al., 2014). Lean practices such as Kaizen, Just in Time (JIT), and continuous improvement require continuous monitoring mechanisms so that efficiency goals can be optimally achieved. Therefore, the success of lean manufacturing is highly dependent on the effectiveness of the management control system that the organization implements.

From the perspective of Contingency Theory, organizations that implement lean manufacturing require a different control system design than conventional organizations because their orientation emphasizes flexibility, quality, and continuous improvement (Chenhall, 2003). The management control system functions to integrate lean strategic objectives with operational activities through relevant performance indicators and effective feedback mechanisms. International research shows that organizations that successfully implement lean manufacturing tend to have more effective Management Control Systems due to increased process transparency, more accurate performance measurements, and better coordination between work units (Fullerton et al., 2014). Lean manufacturing also encourages the broader use of non-financial information to support performance evaluation and operational decision-making.

In the context of MSMEs, the implementation of lean manufacturing allows organizations to optimize limited resources through reducing waste and improving business process efficiency. This condition increases the need for a control system that can effectively supervise the implementation of operational activities. Thus, the higher the level of lean manufacturing

implementation, the more effective the Management Control Systems applied in MSMEs.

H3: Organizational Culture Has a Positive Effect on the Effectiveness of Management Control Systems (MCS)

The third hypothesis states that organizational culture has a positive effect on the effectiveness of Management Control Systems (MCS). Organizational culture is a set of values, beliefs, norms, and assumptions that guide the behavior of organizational members in carrying out daily activities (Schein, 2004). In the management control literature, organizational culture is seen as a form of informal control that complements formal control through the formation of behaviors that are in line with the organization's goals. An effective control system depends not only on formal procedures, but also on the willingness of individuals to implement the rules and values that the organization has set (Simons, 1995). A strong organizational culture can increase commitment, collaboration, and work discipline to support the successful implementation of a management control system. When organizational values are understood and accepted by all members of the organization, the control process becomes more effective because individuals voluntarily act in accordance with the organization's goals.

International research shows that an organizational culture that is oriented towards learning, innovation, and performance has a positive relationship with the effectiveness of management control systems (Bedford et al., 2016). A culture that supports open communication also improves the quality of information used in the evaluation and managerial decision-making process. In the context of MSMEs, organizational culture is often directly influenced by the values embraced by business owners. Therefore, a positive culture will strengthen. The implementation of a control system through increased compliance with procedures, work coordination, and the achievement of organizational goals (Simons, 1995). Thus, the hypothesis that organizational culture has a positive effect on the effectiveness of MCS can be justified theoretically as well as empirically.

H4: Uncertainty of the External Environment Has a Positive Effect on the Effectiveness of Management Control Systems (MCS)

The fourth hypothesis states that the uncertainty of the external environment has a positive effect on the effectiveness of MCS. Environmental uncertainty refers to the level of change and uncertainty that organizations face due to market dynamics, competition, regulation, technology, and customer preferences (Chenhall, 2003). Contingency Theory explains that the effectiveness of a management control system is determined by the suitability between the characteristics of the control system and the environmental conditions faced by the organization. As the level of uncertainty increases, organizations need broader, faster, and more relevant information to support decision-making processes (Chenhall, 2003). The uncertain environment encourages organizations to increase the use of control systems as a tool for monitoring and managing risk. In these conditions, MCS serves as a mechanism to identify environmental changes, evaluate their impact on the organization, and formulate the necessary actions to maintain organizational performance.

Empirical research shows that organizations operating in dynamic environments tend to use more comprehensive and interactive control systems than organizations that operate in stable environments (Bedford, 2020). An adaptive control system allows organizations to respond to changes more quickly and effectively (Simons, 1995).

In the context of MSMEs, environmental uncertainty can come from changes in consumer behavior, economic fluctuations, and the rapid development of digital technology. Therefore, increased environmental uncertainty will increase the need for an effective control system so that the fourth hypothesis is acceptable.

H5: Digitalization Has a Positive Effect on the Effectiveness of Management Control Systems (MCS)

The fifth hypothesis states that digitalization has a positive effect on the effectiveness of Management Control Systems. Digitalization is the process of integrating digital technology into business activities to improve the efficiency, quality of information, and decision-making capabilities of organizations (Verhoef et al., 2021). Digital transformation has changed the way

organizations collect, process, and distribute managerial information (Bhimani, 2020). Digital technology allows organizations to obtain data in real-time so that the control process can be carried out faster and more accurately. From a management control perspective, digitalization improves the organization's ability to monitor, evaluate, and report on performance on an ongoing basis. The use of technology such as cloud computing, artificial intelligence, big data analytics, and enterprise resource planning (ERP) is able to increase the effectiveness of the control system through the provision of more comprehensive information (Bhimani, 2020).

International research shows that digitalization contributes to improving the quality of management information, organizational transparency, and decision-making effectiveness (Verhoef et al., 2021). Digitalization also allows for better integration between organizational strategies and management control systems (Granlund, 2023). In the context of MSMEs, digitalization helps overcome resource limitations through business process automation and faster information provision (Bhimani, 2020). Thus, the higher the level of digitalization implemented by MSMEs, the more effective the Management Control Systems used.

H6: Management Control Systems (MCS) Have a Positive Effect on MSME Performance

The sixth hypothesis states that Management Control Systems (MCS) have a positive effect on MSME performance. Management Control Systems are a set of formal and informal mechanisms used to ensure that the behavior of organizational members is in line with the strategic goals that have been set. MCS functions as a means of planning, coordination, communication, performance measurement, evaluation, and providing feedback that supports the achievement of organizational goals.

According to the modern management control framework, the effectiveness of the organization is largely determined by the control system's ability to integrate strategy with daily operational activities. An effective control system allows management to monitor the achievement of targets, identify deviations, and take corrective actions in a timely manner. Through these functions, organizations can improve efficiency in the use of resources and strengthening adaptability to changes in the business environment (Chenhall, 2003).

In the perspective of the Resource-Based View, MCS can be seen as an organizational capability that allows the resources owned by the company to be used more effectively to produce superior performance (Barney et al., 2021). A good control system helps organizations optimize asset utilization, increase productivity, and strengthen information-driven decision-making processes. Therefore, the existence of MCS is an important factor in creating a sustainable competitive advantage. Various international studies show that the effectiveness of Management Control Systems has a positive relationship with organizational performance both from financial and non-financial aspects (Bedford, 2020). The use of a comprehensive operating system has been proven to increase profitability, sales growth, productivity, innovation, and customer satisfaction (Davila et al., 2010). MCS also plays a role in improving the organization's ability to achieve strategic goals through the alignment of individual goals and organizational goals.

In the context of MSMEs, the existence of a management control system is becoming increasingly important because limited resources demand a more efficient and targeted use of resources (Davila et al., 2010). MCS helps MSME owners manage business operations, control costs, evaluate target achievements, and improve the quality of decision-making (Merchant, 2017). Thus, the more effective the Management Control Systems implemented, the higher the performance of MSMEs that can be achieved.

H7: Management Control Systems Do Not Mediate the Influence of Intellectual Capital on MSME Performance

The seventh hypothesis states that Management Control Systems (MCS) mediate the influence of intellectual capital on the performance of MSMEs. However, the results of the study showed that the mediating role of MCS in the relationship was not significant. These findings indicate that although intellectual capital is an important strategic resource for MSMEs, its existence has not been able to improve performance through the mechanism of an effective management control system.

Intellectual capital, which consists of human capital, structural capital, and relational capital, is indeed seen as intangible assets that can create added value for organizations. However,

in the context of MSMEs, the use of intellectual capital is often informal and has not been systematically documented, making it difficult to integrate it into structured Management Control Systems practices. This condition causes MCS to not be able to become a mechanism that bridges the influence of intellectual capital to improve business performance.

Based on the Resource-Based View (RBV) perspective, strategic resources will only produce a competitive advantage if they meet the criteria of valuable, rare, inimitable, and organized (Barney et al., 2021). The organized element emphasizes the importance of the organization's ability to manage its resources. The results of this study show that MSMEs do not have an adequate level of organization to convert intellectual capital into control information that can support performance improvement. Thus, the existence of MCS has not been able to optimize the benefits of intellectual capital significantly.

This finding can also be explained through the characteristics of MSMEs that tend to have a simple control system and are oriented to the experience of business owners. Many MSMEs still rely on informal communication, direct supervision, and owner-centered decision-making processes, so the use of knowledge, skills, and external relationships has not been integrated into a formal control system. As a result, the human capital owned by business actors has not been translated optimally through MCS to improve operational effectiveness and organizational performance., in addition, structural capital such as operational procedures, knowledge documentation, and information systems in MSMEs are generally still limited. This condition causes MCS to not obtain adequate organizational infrastructure support to manage and utilize intellectual capital effectively (Secundo et al., 2016). Similarly, relational capital in the form of relationships with customers, suppliers, and business partners is more widely used directly by business owners without going through formal control mechanisms that can strengthen organizational performance.

The results of this study are in line with the view of Contingency Theory which states that the effectiveness of the management control system depends on the compatibility between organizational characteristics, the business environment, and the level of operational complexity. In MSMEs with a simple organizational structure, the implementation of formal MCS is often not the main need in intellectual capital management. Therefore, although intellectual capital has the potential to improve performance, MCS has not been able to carry out the mediation function effectively in the context of MSMEs.

This finding is different from the research of Demartini & Beretta (2020) who found that management control systems can strengthen the use of intellectual capital in organizations that have a high level of formalization. The difference in results is possible because most of the MSMEs in this study are still at the stage of organizational development that has not adopted comprehensive MCS practices. Thus, the existence of MCS has not been able to transform the knowledge and abilities possessed by the organization into operational advantages that have an impact on improving performance.

Based on these results, it can be concluded that Management Control Systems do not significantly mediate the influence of intellectual capital on the performance of MSMEs. These findings show that increasing intellectual capital in MSMEs is not necessarily followed by increasing the effectiveness of the management control system. Therefore, MSME owners need to strengthen knowledge management practices, documentation of work procedures, the use of information technology, and the development of a more structured control system so that their intellectual capital can be converted into better organizational performance.

H8: Management Control Systems Mediate the Influence of Lean Manufacturing on MSME Performance

The eighth hypothesis states that Management Control Systems (MCS) mediate the influence of lean manufacturing on the performance of MSMEs. However, the results of the study showed that the mediating role of MCS in the relationship was not significant. These findings indicate that the implementation of lean manufacturing in MSMEs has not been fully integrated with a management control system that is able to strengthen its impact on improving organizational performance.

Lean manufacturing focuses on creating customer value through the elimination of waste, increased process efficiency, and continuous improvement. In MSMEs, the application of lean

principles is generally still informal and based on the experience of business owners, so it has not been supported by a structured control system (Fullerton et al., 2014). As a result, the performance gains resulting from lean practices are more directly obtained through operational efficiencies than through MCS mechanisms.

The Contingency Theory perspective explains that the effectiveness of a control system depends on the compatibility between the characteristics of the organization and the design of the control system used. Most MSMEs have a simple organizational structure, limited resources, and a decision-making process that is centered on business owners. Under these conditions, lean practices can be executed without the need for a complex formal control system. Therefore, MCS has not been able to play the mediation function optimally.

These findings show that the success of the implementation of lean manufacturing in MSMEs is more determined by a commitment to operational efficiency and a culture of continuous improvement than by the effectiveness of the management control system. Thus, MCS does not significantly mediate the influence of lean manufacturing on the performance of MSMEs.

H9: Management Control Systems Do Not Mediate the Influence of Organizational Culture on MSME Performance

The ninth hypothesis states that Management Control Systems (MCS) mediate the influence of organizational culture on the performance of MSMEs. However, the results of the study showed that MCS did not significantly mediate the relationship. These findings indicate that organizational culture in MSMEs influences performance more directly without going through a formal control system mechanism.

Organizational culture is a set of values, norms, and beliefs that direct the behavior of organizational members in achieving a common goal (Schein, 2004). In the context of MSMEs, organizational culture tends to be formed informally through the example of business owners, close interpersonal relationships, and direct communication in daily activities. These characteristics make organizational values more easily transmitted through social interaction than through formal control procedures.

According to Contingency Theory, the effectiveness of MCS is greatly influenced by the level of organizational complexity and the need for control formalization. Since most MSMEs have a simple organizational structure, internalizing cultural values does not require a complicated control system. This explains why MCS is unable to significantly mediate the relationship between organizational culture and MSME performance.

These findings indicate that organizational culture in MSMEs functions as an informal control mechanism that directly affects employee work behavior, commitment, and productivity. Therefore, strengthening organizational culture remains important for performance improvement, even if not through the MCS mediation channel.

H10: Management Control Systems Do Not Mediate the Influence of External Environmental Uncertainty on MSME Performance

The tenth hypothesis states that Management Control Systems (MCS) mediate the influence of external environmental uncertainty on the performance of MSMEs. However, the results of the study showed that the mediating role of MCS in the relationship was not significant. These findings indicate that the management control system implemented by MSMEs has not been able to convert information about changes in the external environment into strategic decisions that have an impact on improving organizational performance.

The uncertainty of the external environment describes the conditions when organizations face difficulties in predicting market changes, technological developments, business competition, and government regulations that can affect operational activities. In a situation full of uncertainty, organizations are required to have high adaptability to be able to maintain competitiveness and business sustainability. Therefore, a management control system theoretically serves as a mechanism that helps organizations obtain relevant information to support the planning and decision-making process.

Based on the perspective of Contingency Theory, the effectiveness of Management Control Systems depends on the compatibility between the characteristics of the external environment and the design of the control system applied by the organization. As environmental uncertainty

increases, organizations need more flexible, interactive, and learning-oriented control systems to respond quickly and appropriately to change. However, the results of this study show that MCS in MSMEs does not have these characteristics so that they are not able to carry out the mediation function effectively.

In practice, most MSMEs still rely on intuition, business owners' experience, and informal communication in responding to changes in the external environment. Business decisions are often made reactively based on the prevailing market conditions, without being supported by a structured information and control system. This condition causes information obtained from the external environment to not be fully integrated into the planning, budgeting, and evaluation processes of organizational performance. These findings also show that the adaptability of MSMEs to environmental uncertainty is more influenced by the organizational flexibility and entrepreneurial experience of business owners than the effectiveness of the management control system. Thus, even though MCS is used in operational activities, its existence has not been able to be a mechanism that bridges the influence of external environmental uncertainty on improving the performance of MSMEs.

The results of this study are different from the research of Bedford (2020) which states that an adaptive control system can help organizations reduce the negative impact of environmental uncertainty through improving information quality and decision-making. The difference in results is possible because previous research has been done on organizations with a higher level of control formalization. Meanwhile, MSMEs in this study still have limitations in terms of human resources, information technology, and analytical capabilities needed to develop a control system that is responsive to environmental dynamics.

Thus, it can be concluded that Management Control Systems do not significantly mediate the influence of external environmental uncertainty on the performance of MSMEs. These findings show that the existence of a management control system in MSMEs is not effective enough in turning external environmental challenges into opportunities to improve organizational performance. Therefore, MSMEs need to develop a more flexible, interactive, and information-based control system to increase their adaptability to changes in the increasingly dynamic business environment.

H11: Management Control Systems Do Not Mediate the Influence of Digitalization on MSME Performance

The eleventh hypothesis states that Management Control Systems (MCS) mediate the influence of digitalization on the performance of MSMEs. However, the results of the study showed that the mediating role of MCS in the relationship was not significant. These findings indicate that the implementation of digitalization in MSMEs has not been fully able to translate through the management control system into improving organizational performance. Digitalization is the process of utilizing digital technology to improve operational efficiency, information quality, and organizational decision-making capabilities (Verhoef et al., 2021).

Various digital technologies such as cloud computing, big data analytics, artificial intelligence, and accounting information systems allow organizations to obtain information faster, more accurately, and in real-time. However, the benefits of digitalization will not be optimal if organizations do not have a control mechanism that is able to integrate this information into the process of planning, measuring, and evaluating performance. The results of this study show that digitalization implemented by MSMEs in Region III Cirebon is more oriented towards operational aspects, such as digital marketing, the use of social media, electronic transactions, and the fulfillment of electronic-based tax administration obligations. This condition causes digital technology to function more as a tool to support daily business activities than as a strategic instrument that is integrated with a management control system.

Based on the Resource-Based View (RBV) perspective, digital technology is a strategic resource that can create a competitive advantage if supported by the organization's capabilities in managing and utilizing it effectively. In the context of this study, the results of insignificant mediation indicate that MSMEs do not have adequate control capabilities to convert digital information into a basis for strategic decision-making that can improve organizational performance.

In addition, according to Contingency Theory, the effectiveness of MCS depends on the fit

between the characteristics of the organization, the business environment, and the design of the control system applied. Most MSMEs have limited human resources, technological infrastructure, and analytical competence in utilizing digital data. As a result, although digitalization has been adopted, the resulting information has not been fully utilized in the management control process. These findings show that digitalization has not automatically strengthened the effectiveness of MCS in improving the performance of MSMEs. The adoption of digital technology that is not followed by changes in management control practices has caused MCS to not be able to play a mediation role optimally. In other words, digitalization and MCS are still partially running and have not been integrated in supporting the achievement of organizational goals.

The results of this study are different from the research of Verhoef et al. (2021) which states that digital transformation can improve organizational performance through improving the quality of control and decision-making systems. This difference is possible because the organizations studied previously have a higher level of digital maturity compared to MSMEs in this study. In MSMEs, the digitalization process is still at the basic adoption stage so it has not been able to encourage the transformation of the management control system as a whole. Thus, it can be concluded that Management Control Systems do not significantly mediate the influence of digitalization on the performance of MSMEs. These findings show that the benefits of digitalization to performance improvement are not entirely dependent on the effectiveness of management control systems. Therefore, MSMEs need to increase the integration between digital technology and management control practices through the development of digital competencies, the use of integrated information systems, and the use of data as a basis for strategic decision-making to optimize organizational performance.

CONCLUSION

This study concludes that Intellectual Capital, Lean Manufacturing, Organizational Culture, External Environmental Uncertainty, and Digitalization are proven to have a positive effect on the effectiveness of Management Control Systems (MCS), as well as MCS have a positive effect on the performance of MSMEs in Region III Cirebon. Uncertainty in the external environment is the strongest predictor of the effectiveness of MCS, followed by intellectual capital and digitalization, which reflects a shift in the orientation of MSMEs towards a knowledge-based economy and digital transformation. However, MCS has not been proven to be able to significantly mediate the influence of these five variables on the performance of MSMEs, which indicates that the management control system in MSMEs in this region still functions more as an operational control tool than as a strategic instrument, due to the limited level of formalization, centralization of decision-making, and suboptimal organizational maturity. Therefore, it is necessary to strengthen a more comprehensive MCS through improving human resource competencies, developing structured operational procedures, and utilizing more integrated digital technology so that MSME strategic resources can be converted into sustainable competitive advantages.

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AUTHOR CONTRIBUTION STATEMENT

Irwan Sutirman Wahdiat: Acts as the *lead author* and makes a dominant contribution in all stages of research. Contributions include the formulation of research ideas and conceptualization, the preparation of research designs, the development of theoretical frameworks, the determination of research hypotheses, and the selection of methodologies used. In addition, Irwan Sutirman Wahdiat is responsible for the overall supervision and management process of research, including the coordination of research implementation. The lead author also analyzed the data using *the Structural Equation Modeling-Partial Least Squares (SEM-PLS)*

method, interpreted the research results, prepared an initial draft of the manuscript, developed the discussion and implications of the research, and made substantial revisions to the manuscript to the final stage. Irwan Sutirman Wahdiat is also responsible as *the corresponding author* in the communication and correspondence process related to the publication of this article.

Krisdiana: Contribute to supporting the implementation of research, especially in literature study activities, data collection, management and verification of research data, as well as assisting in the validation process of research instruments. Krisdiana also plays a role in reviewing and editing manuscripts, compiling tables and visualizing research results, and providing input in improving manuscripts based on the results of discussions with the main author. In addition, Krisdiana also conducted a review of the final version of the manuscript before submitting it for publication.

All authors have read and approved the final version of the published manuscript and declare responsibility for the integrity, accuracy, and scientific validity of the entire content of the article. However, the main contribution in conceptualization, research implementation, data analysis, manuscript preparation, and scientific decision-making in this study is Irwan Sutirman Wahdiat as the lead *author*.

REFERENCES

- Amanda, P. A. A. E. and G. U. (2025). The Influence of Accounting Knowledge, Information Technology, and Government Support on the Use of Accounting Information on MSMEs in Tulung Melati Village, Bekri District, Central Lampung Regency. *Majapahit Journal of Islamic Finance and Management*, 5(4), 3565–3582.
- Barney, J. B., Ketchen, D. J., & Wright, M. (2021). Resource-Based Theory and the Value Creation Framework. *Journal of Management*, 47(7). <https://doi.org/10.1177/01492063211021655>
- Bedford, D. S. (2020). Conceptual and empirical issues in understanding management control combinations. *Accounting, Organizations and Society*, 86. <https://doi.org/10.1016/j.aos.2020.101187>
- Bedford, D. S., Malmi, T., & Sandelin, M. (2016). Management control effectiveness and strategy: An empirical analysis of packages and systems. *Accounting, Organizations and Society*, 51. <https://doi.org/10.1016/j.aos.2016.04.002>
- Bhimani, A. (2020). Digital data and management accounting: why we need to rethink research methods. *Journal of Management Control*, 31(1–2). <https://doi.org/10.1007/s00187-020-00295-z>
- Cameron, K. s., & Quinn, R. E. (2006). Diagnosing and Changing Organizational Culture. In *The Jossey-Bass Business & Management Series*. https://doi.org/10.1111/j.1744-6570.2006.00052_5.x
- Chenhall, R. H. (2003). Management control systems design within its organizational context: Findings from contingency-based research and directions for the future. *Accounting, Organizations and Society*, 28(2–3). [https://doi.org/10.1016/S0361-3682\(01\)00027-7](https://doi.org/10.1016/S0361-3682(01)00027-7)
- Davila, A., Foster, G., & Jia, N. (2010). Building sustainable high-growth startup companies: Management systems as an accelerator. *California Management Review*, 52(3). <https://doi.org/10.1525/cmr.2010.52.3.79>
- Demartini, M. C., & Beretta, V. (2020). Intellectual capital and SMEs' performance: A structured literature review. *Journal of Small Business Management*, 58(2). <https://doi.org/10.1080/00472778.2019.1659680>
- Farida, I., Aryani, Y. A., & Setiawan, D. (2022). EMPIRICAL EVIDENCE OF MANAGEMENT CONTROL SYSTEM IN THE EMERGING MARKET. *Corporate and Business Strategy Review*, 3(2). <https://doi.org/10.22495/cbsrv3i2art10>
- Fullerton, R. R., Kennedy, F. A., & Widener, S. K. (2014). Lean manufacturing and firm performance: The incremental contribution of lean management accounting practices. *Journal of Operations Management*, 32(7–8). <https://doi.org/10.1016/j.jom.2014.09.002>
- Hair, J. F., M. Hult, G. T., M. Ringle, C., Sarstedt, & Marko. (2022). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM) [3 ed]. In *Angewandte Chemie International Edition*, 6(11), 951–952. (Vol. 3, Number 1).
- Kaplan, R. S., & Norton, D. P. (2016). Scorecard: Translating Strategy into Action. *Harvard Business*

Press.

- Klingenberg, C. O., Borges, M. A. V., & Antunes, J. A. do V. (2022). Industry 4.0: What makes it a revolution? A historical framework to understand the phenomenon. *Technology in Society*, 70. <https://doi.org/10.1016/j.techsoc.2022.102009>
- Lyu, C., Swatdikun, T., Lakkanawanit, P., & Issayeva, G. (2025). The Performance Impact of Management Control Systems: Assessing the Mediating Role of Organizational Culture. *Emerging Science Journal*, 9(6). <https://doi.org/10.28991/ESJ-2025-09-06-010>
- Merchant, K. A., and W. A. V. der S. (2017). Management control systems. Upper Saddle River, NJ. *Financial Times/Prentice Hall*.
- Ministry of Cooperatives and Small and Medium Enterprises of the Republic of Indonesia. (2024). Data on the development of micro, small, and medium enterprises in 2024. Ministry of Cooperatives and SMEs of the Republic of Indonesia.
- Nuryanto, U. W., Basrowi, Quraysin, I., & Pratiwi, I. (2024). Environmental management control system, blockchain adoption, cleaner production, and product efficiency on environmental reputation and performance: Empirical evidence from Indonesia. *Sustainable Futures*, 7, 100190. <https://doi.org/10.1016/j.sftr.2024.100190>
- Parul. (2024). Strategic Management in a Dynamic Business Environment. *Universal Research Reports*, 11(1), 122–125. <https://doi.org/10.36676/urr.v11.i1.18>
- Schein, E. H. (2004). Organizational Culture and Leadership, Third Edition. *Published by Jossey-Bass*, 7(San Francisco,CA).
- Secundo, G., Dumay, J., Schiuma, G., & Passiante, G. (2016). Managing intellectual capital through a collective intelligence approach: An integrated framework for universities. *Journal of Intellectual Capital*, 17(2). <https://doi.org/10.1108/JIC-05-2015-0046>
- Sima, V., Gheorghe, I. G., Subić, J., & Nancu, D. (2020). Influences of the industry 4.0 revolution on the human capital development and consumer behavior: A systematic review. *Sustainability (Switzerland)*, 12(10). <https://doi.org/10.3390/SU12104035>
- Simons, R. (1995). Levers of Control: How Managers Use Innovative Control Systems to Drive Strategic Renewal. In *Academy of Management Executive* (Vol. 9, Number 2).
- Verbeke, A., & Hutzschenreuter, T. (2021). The dark side of digital globalization. *Academy of Management Perspectives*, 35(4). <https://doi.org/10.5465/amp.2020.0015>
- Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Qi Dong, J., Fabian, N., & Haenlein, M. (2021). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business Research*, 122(July 2018), 889–901. <https://doi.org/10.1016/j.jbusres.2019.09.022>